

## Agricultural Department.

CONDUCTED BY ALBERT CHAPMAN.

PROGRAMME OF MEETING OF the Board of Agriculture, Manufactures and Mining, at Ludlow, Wednesday and Thursday, December 1st and 2d, 1875.

Wednesday afternoon.—1. Address of welcome, by L. G. Fullam, Ludlow; 2. Report of the Board of Agriculture, by Albert Chapman, Agricultural Editor Middlebury Register; 3. Water power of Vermont, by Henry Clark, editor Rutland Globe.

Wednesday evening.—Does farming pay equal to the professions, by A. F. Hubbard, Tyson Furnace; Opportunities for young farmers, by John B. Mead, Randolph.

Thursday morning.—What are the serious and common impediments that hinder the prosperity of the farmer, by Ex-Gov. Hyland Fletcher, Cavendish; Waste on the farm, by C. Horace Hubbard, Springfield.

Thursday afternoon.—The principles of fertilization, by J. C. Stickney, Tyson Furnace; Does land leach, by L. F. Wheeler, Ludlow.

Thursday evening.—The general dairy interest, by Alexis P. Smith, New Haven; The setting of milk, by L. G. Fullam, Ludlow; The selection and care of cows for the butter dairy, by Gardner S. Fassett, Enosburgh.

### Quality of Milk.

"The Winthrop (Maine) cheese factory, during a season of eighty-three days, averaged only 8.07 pounds of milk to a pound of cheese. The milk was chiefly that of Jersey and grade Jersey cows. The cheese was also of high quality. We have heard of no other factory that averaged much less than ten pounds of milk to a pound of cheese. The three best cows whose milk went to this factory were pure Jerseys, and yielded from thirty-five to thirty-seven and one-half pounds of milk per day. It has been generally supposed that Jerseys were useless for the cheese dairy, but this success will doubtless encourage other tests."—[Exchange.]

We alluded, recently, to our experiments and investigations made a number of years ago, in relation to the quality of milk. Among the more surprising results attained was the discovery that the specific gravity of milk does not vary with its quality; that is, the milk of different cows may be of very nearly the same specific gravity, and yet differ greatly in richness. It is this fact (the discovery of which was the result of frequently repeated and varied tests) that explains why the specific gravity instrument is so useful in determining water adulteration of milk. The editor of the Boston Cultivator, who is always, and very rightly too, demanding that the test of actual experiment should be applied to agricultural theories, has disputed our conclusions on this point, though they were reached by experiments that utterly changed our own preconceived opinion, based, like his own stiffly maintained views, on theory alone.

How is the singular fact in reference to milk, noted above, to be explained and reconciled with the equally well known fact, that the milk of a farmer and Mr. Wetherell's present theory is based? That prior fact is, that cream is lighter than the watery constituent of milk, and that an increase of cream in milk will, therefore, reduce its specific gravity. The inference that has been drawn from this fact, and upon which Mr. Wetherell pins his faith, is that cream, rich in cream will show a less specific gravity on that account. But the truth, as shown by actual and repeated test, is different. Milk rich in cream does not usually show a less specific gravity than milk poor in cream. Where there is variation, it is quite as likely to show a greater specific gravity. The milk of our own Jersey cow has usually a specific gravity of one thousand and thirty-two, though she makes over an ounce of butter to a pound of milk. N. T. Sheafe, Esq., of Derby Line, Vt., for many years a breeder of Jerseys, writes that his own Jersey cow, which tests had shown that a quart of Jersey milk is heavier than a quart of common milk. He is a very accurate man, and has tried the experiment repeatedly, because he, as well as Mr. Wetherell and himself, expected a different result, on account of the presence of so much cream in the milk.

How is this curious phenomenon explained? Real facts are not contradictory, though they may seem so. The discovery of a tertium quid, as our scholastic brother editor would say, a third fact—sets these two apparently inconsistent facts in perfect harmony. This tertium quid is the fact that the casein and sugar in milk increase pari passu (more Latin, brother Wetherell), increase, we should say, equally with the cream. When the milk of a cow is rich, it is rich in casein and sugar as well as in butter. When the milk of a cow increases in richness there is an addition of casein and sugar, as well as of butter. Now the casein and sugar in the milk are heavier than the water, so that these heavier constituents increase the specific gravity as much as the cream lessens it—sometimes a little more, which accounts for Mr. Sheafe's discovery.

The extract at the head of this article is entirely confirmatory of this view, showing as it does that Jersey milk will not only make more butter, but more cheese, in proportion to its bulk, than common milk. That is, Jersey milk is richer every way, than the milk of other breeds.

In regard to the specific gravity test of milk, we wish to note that the want of a little knowledge often leads persons who try experiments into serious errors. In testing milk by its specific gravity, no accurate results can be obtained, unless all the samples are tested at the same temperature. A variation of a few degrees of temperature in the different samples will entirely vitiate the test. But when this simple point is observed, we never yet, in many hundred experiments, have found the specific gravity of milk from healthy cows (not fed on distillery or brewery slop) to vary as much as three degrees of the hydrometer. When the milk of a healthy dairy has been poured together, we have never been able to note a variation so great as two degrees.

But too much must not be claimed for the hydrometer. It does not give, in itself, conclusive evidence of the adulteration of milk with water. But

it gives very strong presumptive evidence. The common trick by which it has frequently been attempted to discredit this instrument, is to skim the milk, add a little water to it, and then offer it for testing. Here the hydrometer will fail, since it is capable only of showing the specific gravity, and the specific gravity of skimmed milk is greater than that of whole milk. A little water may be added to it, and then it will show the same specific gravity as whole milk. So distillery or brewery slop milk may be adulterated, yet the hydrometer will indicate a specific gravity as low as one thousand and twenty-seven, which in the milk of farm-fed cows would raise the suspicion that a little water had been added.

The use of the hydrometer in testing milk for adulteration is this: It at once raises a reasonable suspicion that water has been added, when the hydrometer shows a less specific gravity, (the milk being at sixty degrees), than ten hundred and thirty. Reasonable suspicion is not certainty, yet the reasonable suspicion which the nose gives that a skunk has been around, is not greatly increased, in an intelligent mind, by the sight of the animal. So it is with the hydrometer test of milk. If the milk delivered to a cheese factory (or any other milk consumer) shows by the hydrometer, at sixty degrees of temperature, a less specific gravity than ten hundred and thirty, something is certainly wrong. The milk may be watered, or the cows may be sick, or they are being fed with fermented slops, (which will soon make them sick).

But it must be borne in mind that cream may be stolen from the milk, and a little water added, yet the hydrometer will not detect the fraud. So that in addition to the hydrometer, it is necessary to use milk tubes to test the richness of the milk in cream. If the percentage of cream is steadily much less than that of other patrons of the factory (or, in the case of private consumers, if the amount of cream is comparatively small), fraud by skimming may be reasonably inferred.

In this article we have given the degrees as shown by the regular specific gravity instrument for fluids, called the hydrometer. But the cheese factories and other milk buyers frequently use a special instrument, called a lactometer, which is more coarsely graduated, and upon the scale of which twenty corresponds to ten hundred and thirty on the hydrometer scale. A final point ought also to be noted, in order to avoid misconception or misunderstanding. In testing a cow's milk by the hydrometer, the whole product of a milking must be used, from which to take the sample to be tested. It is well understood by dairymen that the first drawn milk is poorer than the last drawn at each milking. For quibbling in argument (or "logomachy") this point can be made of use, to raise a dust; but in practice, such splitting of milk rarely occurs, and when it does occur it is easily detected by the milk tube test.—[DR. HOSKINS in Watchman and Journal.]

Mr. Willard has written a letter to the London Agricultural Gazette on the state of the cheese trade in the United States. He says the wisest factory managers have sold their product regularly through the season, at the best attainable price, while others, especially in Canada, have piled their shelves with large quantities "to await the chances of a most unpromising future." He regards present prices as below the cost of production, and the stock on hand as enormous.

There is now in this country a mass of cheese which is stranded, high and dry, above the existing trade current. It is this summer's make which will prove such a sad loss to producers. There cannot be less than 250,000 boxes now lying in the several dairy regions. This amount seems just about the measure of this season's overproduction. It is sufficient to the demand. What will become of the surplus is a question. If any one can think of any use to which it can be put it he can obtain the material which I have spoken of the disasters which have come to some in the trade. There have been a number of failures among dealers in dairy products, although I have yet to learn of a house which has failed directly through the decline of cheese. The failures have come from launching away from the dairy, and taking poor chances on grain and hogs. Those who have clung to the dairy have not made anything, but they have generally been too cautious to take very great risks. There is, however, in the interior considerable distrust of the New York dealers, and the New York dealers in turn assure us that the shippers are possessed of no property, and are liable to go up at any time. Of course the dissatisfaction in the trade leads each of the cheese handling houses to look with distrust upon the other classes, and the result is a demoralization and discomfort all around the box.

All the items in the present outlook seem to declare that the season of 1874 marked the close of an epoch in American dairying. Up to that time it was going on prospering and to prosper. This year marks the climax and the reversing. Hence it will build up again. Next year there will be an improvement, because those who will fly from the ship this fall will lighten it, so that it will float on next year's demand. It is not pleasant to think of the farmers who embarked this year with bright hopes on the enlightened practice of dairying, hoping for a share of past rewards; but trade laws are inexorable.

A California paper states that "millions of pounds of mustard, commanding from two and a half to four cents per pound, are annually shipped to Europe from around Los Angeles. A very delicate sweet oil is pressed from it, devoid of acid taste, returned to this country and sold for olive oil. The cake which remains after the oil is expressed is ground up into the ordinary mustard of commerce."

Mr. W. L. Taylor of Washington county, Penn., raised on five acres 1101 bushels of corn the past season. An uncommonly large crop.

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